CLAIMS

1.   A method of determining the position of a TV camera relative to a patterned panel being viewed by the TV camera including the steps of: identifying a plurality of edge points of the pattern from the video

5   signal produced by said camera and using these edge points to calculate the perspective of the pattern relative to the camera.

2.   A method as claimed in claim 1 comprising the steps of: identifying a plurality of first edge points and a plurality of second

10   edge points; and

producing an edge image.

3.   A method as claimed in claim 2 in which said patterned panel comprises a pattern of vertical and horizontal straight edges defining lines

15   delineating a colour difference and in which each edge point is situated on one of said horizontal or vertical straight lines.

4.   A method as claimed in claim 3 in which said plurality of first edge points are clustered to associate edge points to specific lines using a slope

20   and intercept process.

5.   A method as claimed in claim 3 in which said steps of processing

the video signal relating to said first and said second plurality of edge points comprises the steps of :

analysing all detected edge points and grouping together edge points into a first plurality of groups corresponding to horizontal lines and a

5 second plurality of groups corresponding to vertical lines.

6. A method as claimed in claim 5 in which the edge points in the first and second plurality of groups are allocated preliminarily to specific horizontal and vertical lines.

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7. A method as claimed in claim 6 in which the step of allocation is followed by computation of the vanishing points of the horizontal and vertical lines, said vanishing points being computed within a defined location error.

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8. A method as claimed in claim 7 further including the step of :

projecting the edges corresponding to horizontal edges to obtain an edge projection profile map comprising peaks and troughs.

9. A method as claimed in claim 8 further including the step of :

20 assigning each horizontal edge to a most probable peak and producing a list of edges for each of a plurality of candidate lines indicated by the peak.

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10. A method as claimed in claim 9 in which a line is specified for each list of edges, edges not corresponding to any specified line being disregarded.

5   11. A method as claimed in claim 10 in which the steps are repeated for vertical edges and lines.

12. A method as claimed in claim 11 in which accurate vanishing points are computed from the specified lines.

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13. A method as claimed in claim 11 in which the perspective transformation is solved up to the shift and scale determinations for both families of lines.

15   14. A method as claimed in claim 13 in which an accurate line pattern is produced by means of inverse perspective transformation and in which the known pattern on the panel is compared with the edge line pattern.

15. A method as claimed in claim 14 in which said comparison

20   comprises a first step of identifying a first horizontal line in the accurate video image edge pattern, identifying a second horizontal line in the accurate video image pattern, calculating the distance between said first

and second video image lines, comparing the calculated distance between the video image lines with the known pattern to produce a horizontal position and scale determination, repeating said steps to produce a vertical position and scale determination and from said horizontal and vertical

5   position and scale determinations determining the position of the TV camera relative to the panel.

16.   A method as claimed in any one of claims 1 to 15 in which the patterned panel comprises a chroma-key panel having two separately

10   identifiable chroma-key colours.

17.   A method as claimed in any one of claims 1 to 15 in which the patterned panel comprises two or more distance coded families of lines.

15   18.   A method as claimed in any one of claims 1 to 15 in which the patterned panel comprises two or more families of lines such that the lines of each family intersect at a common point.

19.   A method as claimed in claim 16 in which the determination of the

20   position of the TV camera relative to the panel is used to calculate the perspective of a background video picture relative to a foreground object.

20.   Apparatus for determining the position of a TV camera relative to a patterned panel being viewed by the TV camera including:

means for identifying a plurality of edge points of the pattern from the video signal produced by said camera and means for processing these

5   edge points to calculate the perspective of the pattern relative to the camera.

21.   Apparatus as claimed in claim 18 in which the patterned panel is a chroma-key panel.

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22.   Apparatus as claimed in claim 19 further including further processing means for processing said calculated position of the camera, background scene storage means for storage of background scene, perspective displacement means to adjust the perspective of a background

15   scene in accordance with the calculated camera position and video display means for displaying the background scene in a correct perspective on said chroma-key background panel with foreground objects interposed between said camera and said background panel.

20   23.   Apparatus as claimed in any one of claims 20 to 22 in which the patterned panel comprises two or more distance coded families of lines.

24. Apparatus as claimed in any one of claims 20 to 22 in which the patterned panel comprises two or more families of lines such that the lines of each family intersect at a common point.